Big Meadows Management and Monitoring

Introduction

Big Meadows is a 50 hectare ridge-top meadow with a central wetland located along Skyline Drive in Shenandoah National Park (SHEN). The Meadow is a native opening rich in natural and cultural resources including rare plant populations, a globally rare wetland plant community, and historic settlement sites. Big Meadows is the only large non-forested area within SHEN making it a haven for wildlife and plant species that require a more open habitat. The Meadow represents approximately one tenth of one percent of the park's area, yet it supports populations of 18% of the park's state rare plant species, and two state rare animal species. Changes in the Meadow's management since park establishment in 1933 have lead to a dramatic decrease in meadow size and an increase in shrub density.

The Big Meadows landscape looking south from photopoint B in the fall of 2007.

The Big Meadows landscape looking south from photopoint B in the fall of 1998.

Management Needs

The park's current challenge is to manage the meadow in a cost-effective way that maintains the integrity of the existing natural and cultural resources within the context of an esthetically pleasing cultural landscape.

From the time of park establishment (1933) until 1975 the Meadow was regularly mowed. However, from 1976-1999 no large-scale vegetation management was conducted in the Meadow, and as a result, the Meadow decreased in size and began filling in with shrubs such as deerberry (Vaccinium stamineum), maleberry (Lyonia ligustrina), and broad-leaved spirea (Spirea latifolia).

A study of the Meadow vegetation was initiated in 1998 to describe the current status of the vegetation and to monitor changes over time in response to the initiation of new meadow management activities. Plant community field data from 80 randomly located monitoring transects found that in 1998/99 vegetation cover consisted of 17.4% + 2.4% shrub cover.

Current Procedures

In 2000, management activities were implemented in Big Meadows to help restore the open landscape and encourage herbaceous plant cover and diversity. The meadow was mowed in the fall of 2000. From 2000-2004 prescribed burns were conducted in the spring over the entire meadow with selective shrub removal throughout the year. In 2005, a rotation of treatments was begun in the meadow. In any given year 1/3 of the meadow is mowed, 1/3 is burned, and 1/3 is left fallow. These actions are designed to stabilize the boundary, reduce shrub density, and improve rare plant habitat. The vegetation response to these management activities is being regularly monitored using the 80 vegetation monitoring transects for comparison to the 1998/99 baseline data.

Aerial photo pf Big Meadows showing vegetation the locations of the sampling transects and management zones.

Accomplishments

Photographs of vegetation sampling transects within Big Meadows show a dramatic progression from a shrub dominated plant community to one more dominated by herbs as a result of these management actions. Vegetation cover data gathered along transects placed throughout the Meadow also clearly show a

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significant increase in herbaceous cover, and a significant decrease in woody cover in both the upland and wetland areas of the Meadow. The attached figures show this progression of vegetation change.

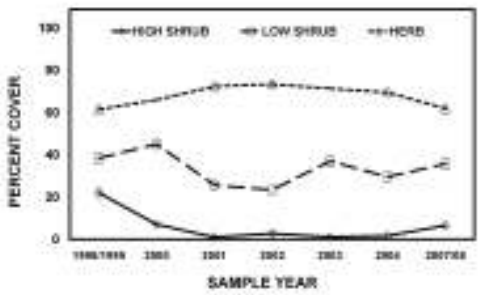
Since 1998, the coverage of shrubs taller than 0.5 meter and those shorter than 0.5 meter have decreased 16% and 2% respectively. The cover of herbaceous species in the upland portions of the Meadow initially increased by 12% when the meadow was frequently burned, but by 2008 had returned to 62% +-3%, a coverage almost identical to pre-management levels. Vegetation in the central wetland of Big Meadows has responded well to yearly management and has shown an 18% increase in herbaceous cover and a reduction of 42% (for shrubs over 0.5 m) and 23% (for shrubs under 0.5 m) in shrub cover from 1998 to 2008.

Rare plant populations within the wetland center of the Meadow have also responded positively to the recent management actions. Two rare sedges, the brown bog sedge (Carex buxbaumii), and the finely nerved sedge (Carex conoidea) have shown increased cover and abundant fruiting.

Tall flowering meadowsweet (Spirea latifolia) shrubs along Big Meadows Central transect 9 in 1999.

Vegetation monitoring field crew sampling vegetation using the point-intercept method along one of the 80 transects in Big Meadows.

Big Meadows Central transect 9 in 2009 showing a more open habitat.



Changes in the percent cover of upland vegetation groups within Big Meadows from 1998-2008.

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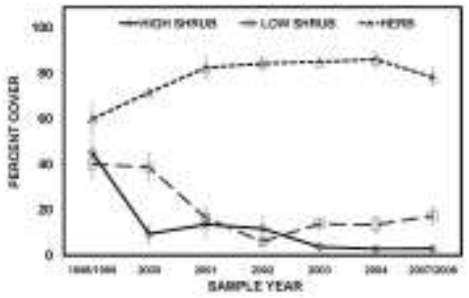

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